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A Study of Innovation in Model Project Design: Addressing Mental Health Symptoms among Co- Occurring Substance Use and Mentally Ill Clients who are Homeless in a Local Community Clinic Setting

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A Study of Innovation in Model Project Design:
Addressing Mental Health Symptoms among Co-Occurring
Substance Use and Mentally Ill Clients who are Homeless
in a Local Community Clinic Setting

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Education Statistics and Research Methods
by

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Abstract

Homeless persons with co-occurring substance use combined with mental illness constitute a particularly vulnerable subgroup with complex service needs. Unfortunately, the capacity to deliver critical treatment services has been extremely limited causing many from this population to remain untreated. Untreated co-occurring disorders can lead to a host of difficulties for both the individual and the community (Bouchery, Harwood, Sacks, Simon, & Brewer, 2011). Developing community based intervention services in Arkansas is a key activity necessary in strategically addressing this problem (Barbee, Gonzales, & Shelor, 2016). In partnership with the Arkansas Division of Behavioral Health Services, a local community treatment provider piloted the Arkansas Treatment for the Homeless program in an attempt to improve substance use, housing, and mental health outcomes for this complex population and to reduce disparities in outcomes among demographic sub-populations within this group. The innovative hybrid program used concepts from the existing *Continuum of Care* and *Housing First* models. This study was a secondary analysis examining this program's effectiveness in reducing mental health symptomology among program participants. As a part of the original evaluation, all participants were asked to complete structured interviews across three time points in which they reported the number of mental health symptoms they were experiencing. The repeated measures multivariate analyses of variance (MANOVAs) with several conditions (i.e., gender, with or without social support, and young vs. old) as the between-subjects factors and time as the within-subjects factor were conducted with 121 client records. Results indicated that participants experienced a significant decrease in negative mental health symptoms across time. However, none of between-subjects effects were found significant. Findings show that this community based program can improve mental health outcomes among this high risk population.

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Chapter One: Introduction

Overview

The National Institute on Drug Abuse (NIDA) reports that the use of alcohol and illicit drugs costs the United States over 400 billion dollars annually in the rise of crime, loss of work productivity, and related healthcare expenditures (2016). Explicably, the relationship among substance use, mental health, and social problems such as homelessness has held the attention of psychological researchers and clinicians alike for centuries (Zerger, 2002). As a result, psychological theories have developed over the decades and have greatly influenced treatment and recovery practices all in an attempt to aide those with mental health, social, and addiction problems into healthier living. The development of social services and treatment programs is an on-going process of blending theoretical frameworks of psychology and human behavior with practices that have been empirically studied to determine effectiveness (Tiffany, 1990).

Among all social and psychological theories, addiction theories in particular have had great differences in thought and various influences regarding the concepts of will, self-control, morality, and spirituality in recovery (West & Brown, 2013). For example, the medical model of addiction postulates substance dependence as a disease often untreatable without medication and incurable. Conversely, the moral model reflected in *Moral Recognition Therapy (MRT)*, a recognized and effective curriculum in treating criminal justice populations), places sole responsibility on the ethical strength (i.e., willpower) of the individual with deviations from treatment plans being punishable by sanctions (Tauber & Huddleston, 1999). While much research has been conducted among mentally ill substance users who are homeless, and many programs have been deemed effective in improving the lives of this vulnerable population, the debate over morality, disease and disability, and community roles is still prominent.

The under pinnings of varying views of social problems, their causes, and the best ways to combat them can be reflected in the numerous models of care, historical “paradigm shifts,” and treatment curricula today. Various treatment models stemming from addiction theories reflect differing alliances with more general psychological theories. Social learning theory for example, attributes maladaptive behaviors such as substance use with environmental factors and learned behaviors (Payton et al., 2008). On the other hand, psychodynamic theory, developed by Sigmund Freud (1923) would attribute drug use as a symptom of underlying psychological problems via self-medicating behavior (Flores, 2001).

Regardless of personal and/or professional theoretical orientation everyone is affected by the issues of homelessness, mental health, and substance use within our communities. These are issues that challenge every individual either directly or indirectly by the high cost associated with the management of these problems in society as well as their correlations with public welfare issues such as criminal activity, child abuse and neglect cases, health disparities, and high chronic disease (Botvin, Baker, Renick, Filazzola, & Botvin, 1984; Bouchery, Harwood, Sacks, Simon, & Brewer, 2011). It is also often the co-occurrence of these social issues that makes successfully implementing interventions and the evaluation of the effectiveness of those interventions so complex.

Significance of the Problem

Through years of research it has been established that there are positive relationships between substance use, poor mental health, and homelessness (Folosm et al., 2005). However, according to the National Healthcare for the Homeless Council (2007), substance use has been shown to be both a precipitating factor and a consequence of homelessness and poor mental health symptoms thus leaving the directions of causality among homelessness, mental health, and

substance use still widely debated. Though estimates vary across studies, researchers at the National Coalition for the Homeless (2009) have estimated that over 38% of homeless persons are alcohol dependent and 26% use other drugs. These estimates are much higher than those reported just 15 years earlier which estimated that 30% of homeless individuals had a substance use disorder (Milby & Schumacher, 1996). Similarly, estimates of the prevalence of mental illness or dual diagnosis (i.e., substance use and mental illness) in the homeless vary widely. Data reported from treatment centers across the nation indicate that 23% of admissions have a co-occurring mental health disorder (Bronner, Smiley-McDonald, Trudeau, Cowell, & Brolin, 2009), but it is noted that this number is likely to be underestimated in the general population due to the numerous access barriers to treatment among the homeless (Martinez & Burt, 2006). Of homeless individuals sampled from homeless shelters, 47% report having both a substance use and mental health problem (Tsemberis, Gulcur, & Nakae, 2004). Because of the strong association among these issues and because directionality continues to be debated, it is widely accepted that interventions inclusively addressing substance use, mental health symptomology and housing needs are in the best interest of the clients (Zerger, 2002). The differing models of care currently debated in the literature however, continue to reflect a fundamental disagreement in thought regarding which diagnosis is primarily important, morality and responsibility of the client and community, and the psychological theoretical frameworks from which those models are developed.

Based upon data from the Arkansas Department of Health and Human Services (DHHS, 2011), among mentally ill persons, the lifetime prevalence of a co-occurring substance use disorder was 22% for alcohol use/dependence and 15% for other drug use/dependence, approximately 2.7 times more than the general population. Among persons with alcohol

use/dependence, the lifetime prevalence for mental illness was 37% and for other drug use/dependence 53%, approximately 2.3 and 4.5 times more than the general population respectively. When compared to substance users not diagnosed with a mental illness, those with a dual diagnosis consistently display more disruptive behavior, have more limited social supports, are more often homeless, prone to violence, have more emergency room visits, and are more likely to be discharged from substance use treatment "against medical/clinical advice" (Dobkin, Civita, Paraherakis, & Gill, 2002; Sharp & Getz, 1998; Substance Use and Mental Health Services Administration, [SAMHSA];U.S. Department of Health and Human Services [HHS], 2010). Furthermore, of those that meet the federal definition of chronic homelessness (i.e., those who are continuously homeless for 12 months or more or have had four or more episodes of homelessness), 85 % have a co-occurring disorder (Bronner et al., 2009). These issues make mental health treatment, retention, and significant improvements in mental health symptomology a challenge among co-occurring homeless substance users compared to the general substance use population. It is because this sub-population is more at risk for poor treatment outcomes having greater health disparities while contributing disproportionately to high health care costs that continued investigation regarding innovative treatment practices is necessary.

Theoretical Framework

The strength of these positive co-occurring relationship among homelessness, substance use, and mental health symptoms have resulted in the "Bio-Psycho-Social" theory being a widely accepted theory influencing therapeutic models for this population. The Bio-Psycho-Social theory was developed by psychiatrist George Engel in 1977 and asserts that an individual's biological, psychological, and social factors all play an important part in human functioning

within the context of illness (Galizio & Maisto, 1985). Specifically, it holds that all major psychological, learning, and addiction theories have some truth and that treatment should address the person as a whole: mind, body, environment, and spirituality to name a few (Gorsuch, 1995). This theory with resulting treatment models has greatly influenced treatment, recovery, and housing projects today (Gove, 1994). Among those models, two specific models, *Continuum of Care* (U.S. Department of Housing and Urban Development [HUD], 2002) and *Housing First* (Tsemberis, 1992) for homeless individuals with co-occurring disorders have stemmed from the bio-psycho-social philosophy. Although they stem from the same behavioral theory, the differences between the two are great when looking at practical implementation at the community program level.

The *Continuum of Care* (CoC) model uses a linear “stair step approach” to move individuals through stages of “housing readiness” and hinges on required program compliance. The CoC model uses an *Integrated Treatment* approach (Minkoff, 1989) of comorbid mental health and substance use disorders while moving clients through a networked system of emergency shelters to transitional housing and finally permanent housing. Because substance dependence and mental illness are viewed as at least a cyclical if not preliminary condition to homelessness, *Integrated Treatment* is a key component of the CoC model because it attempts to treat the whole person through a recovery process that will eventually provide the coping skills necessary to live independently (Wong, Park, & Nemon, 2006). The *Integrated Treatment* approach will provide an individual with housing (even if temporary at early stages) and with a collaborative treatment team that consists of multiple qualified specialists working together with the client in developing a single treatment plan that addresses the substance use, mental health, and social (i.e. housing) issues comprehensively (Minkoff, 1989). Thus the *Integrated Treatment*

approach addresses all of the client's needs simultaneously. Supporters tout the model's ability to address the individuals needs in a "one stop shop" fashion utilizing both professional and community resources such as Alcoholics Anonymous (Minkoff, 1989). Limitations to this type of project often noted however, are, the expense and feasibility of operating such a large organization (specifically for rural and health shortage areas), a lack of client centered choice and culturally competent practices, and the "all or nothing approach" which can be perceived by clients as coercive while fostering institutionalization (Drake, Mercer-McFadden, Musser, McHugo, & Bond, 1998).

The *Housing First* model on the other hand, addresses the various areas of a person's life in a pragmatic order (Tsemberis et al., 2004) employing only interventions to establish permanent housing first (hence the name) before moving on to adding additional goals or referring to other professionals for individual substance use and mental health needs as understood necessary by the client. The *Housing First* model was developed by Pathways to Housing Inc. in 1992, and closely reflects Maslow's Hierarchy of needs (Hall & Nougaim, 1968) in that it asserts that to truly find "recovery" and a healthy emotional state, an individual's more basic physical and environmental needs must be met first and that homelessness in fact, is a risk-factor for mental health and substance use issues (Baker & Evans, 2016; Tsemberis, et al., 2004). In particular, *Housing First* is a supportive housing model that provides housing services without contingency on mental health and/or substance use treatment participation. Those adopting this modality seek to address the housing needs specifically of those that are chronically homeless, and have either co-occurring mental health and/or substance use disorders. It is believed that by first establishing trust by helping to meet an individual's physical need for food and shelter without the "carrot" of treatment compliance, the stage will be better set for therapeutic success

(Davidson, et al. 2014). While this project has gained popularity over the past two decades, many still strongly disagree that the *Housing First* model is sustainable. Many feel that without the external motivation (or depending on your view coercion) for mental health and substance treatment compliance, those highly correlated issues will remain unaddressed and thus will not result in recovery but rather a dependent disabled population that poses an even higher cost to society (Kawachi & Berkman, 2001). They believe that permanent housing should not be an inherent right but rather function as a motivating goal set for the end of the road to recovery (Dordick, 2002). While housing outcomes are generally better in the *Housing First* model, and substance use outcomes vary across both *Housing First* and *CoC* models, generally, mental health outcomes are not as positive in *Housing First* when compared to the *CoC* model (Kertesz, Crouch, Milby, Cusimano, & Schumacher, 2009). A closer look at the models' similarities, differences, and impacts on client outcomes may provide valuable information for the continued development of programs at the community level designed for this specific sub-population.

According to Bride, MacMaster, and Webb-Robins (2006) there are several limitations to current effectiveness studies attempting to determine if fully-integrated approaches of mental health and substance use disorders within a *CoC* model is more effective than the *Housing First* model. Lydecker et al. (2010) conducted a systematic review and notes that many studies lack control groups, had insufficient sample sizes, and did not control for many potential confounding variables presented both by the patients and the varying treatment program components making inconsistent results and recommendations even more difficult to interpret. Even among promising studies that were sufficiently powered and controlled for cohort effects, there were still several limitations presented such as limited variation in sample demographics, inability to

identify specific factors contributing to a project's successes/failures, and a lack of ability to retest in community settings rather than major urban hubs (Lydecker et al., 2010).

Arkansas Treatment for the Homeless Project (ARTH)

As a public health and social welfare concern, there has been much interest in developing cost effective policies and programs that minimize the negative impact that substance use, homelessness, and mental health issues pose on society when left uninvestigated and unaddressed. An innovative program was developed in Northwest Arkansas to increase access to services for those that are homeless with co-occurring substance use and mental health disorders. The program was named the Arkansas Treatment for the Homeless (ARTH) and was funded in partnership with the Substance Abuse and Mental Health Services Administration (SAMHSA) and the Arkansas Department of Health and Human Services. When the ARTH model was developed pros and cons of both the *CoC* and *Housing First* models were reviewed. The *CoC* model requires vast resources in the areas of infrastructure development and cost, while the *Housing First* model is greatly lacking in mental health outcomes. An effort to pilot and test an innovative approach in developing a substance use treatment model that address both mental health symptomology and housing problems among substance dependent individuals. This translational pilot project was implemented in 2004 – 2009 in a treatment facility in Northwest Arkansas for dually diagnosed homeless individuals. The sustained program partnered with the Arkansas Department of Behavioral Health as the Northwest regional provider by combining the inclusive-whole person approach from the integrated *CoC* model and the client choice philosophy from *Housing First* to create the ARTH in Northwest Arkansas.

The ARTH Project was developed as a cost-effective approach within a Rapid Cycle Quality Improvement (RCQI) effort to reduce readmissions due to reoccurring substance use

problems, mental health symptomology, and housing needs of clients. The project was supported in kind by Substance Use and Mental Health Services Administration (SAMHSA) because of its use of evidence based practices and fiscally responsible principals. The Northwest Arkansas ARTH project was primarily an *Integrated Treatment CoC* model in that it provided a multidisciplinary team for each participant and housing support in the form of transitional housing. What makes this project innovative however, is that each client was able to choose an “out of network” case management and mental health provider without the sobriety contingencies placed on the housing component similar in philosophy to *Housing First* model.

Purpose of the Study

The purpose of this study was to investigate the effectiveness of this innovative ARTH project in improving mental health symptomology among those substance dependent homeless individuals with a co-occurring mental health disorder that participated. Since the previous program only reported client descriptives, substance use, and housing outcomes, this study evaluated the project’s effectiveness on improving the mental health functioning of its participants. Therefore, this secondary data analysis study sought to determine if the provision of the innovative ARTH model of parallel mental health and substance use treatment with housing supports effectively improved mental health symptoms in those with a dual diagnosis who were homeless.

This study analyzed the impact that providing both client choice in case management and mental health treatment within the *CoC* model had on improving mental health outcomes among those with substance dependence who are also homeless. It was hypothesized that participants would have improved mental health symptoms as a function of time in the project. Specifically it aimed to answer the following questions:

- 1) Do participants report the same number of mental health symptoms as a function of time in the program between genders?
- 2) Do participants report the same number of mental health symptoms as a function of time in the program between those with external social supports and those without?
- 3) Do participants report the same number of mental health symptoms as a function of time in the program between younger and older adults?

Chapter Two: Literature Review

As a public health and social welfare concern, there has been much interest in developing cost effective policies and programs that minimize the negative impact that substance use, homelessness, and mental health issues pose on society when left uninvestigated and unaddressed. A review of the strengths, limitations, gaps in knowledge, and controversy in the literature reveal the need for continued research on which models addressing mental health outcomes among substance using and homeless individuals are effective. A discussion of the history, strengths and limitations of an integrated approach within a Continuum of Care (*CoC*) model and alternatively the *Housing First* model will reveal that continued research is necessary and that innovative cost effective projects should be tested for effectiveness.

Overall, it is estimated that fewer than 25% of those who need treatment for substance use problems will receive it, and that there are many organizational barriers to treatment such as lack of treatment slots or limited funding. Individual characteristics such as perceptions of disorders, lack of resources such as transportation, and absent family/social supports are cited as some of the barriers to receiving treatment causing such a high rate of people with untreated addiction diagnoses (U.S. Department of Health and Human Services [HHS], Center for Behavioral Health Statistics and Quality, 2011). These barriers can be exacerbated by the realities of homelessness (Zerger, 2002). Moreover, the cost associated with substance use treatment has long been recognized as a barrier to treatment for low-income individuals (French, Dunlap, Zarkin, McGeary, & McLellan, 1997). In Arkansas financial barriers are even more critical. Until recently Medicaid dollars were denied for substance use treatment for adults, leaving even fewer resources for low income individuals, and among the homeless population (Fitzpatrick, Collier, & O'Conner, 2015).

The many barriers to treatment that affect a person's ability to receive services must be addressed in model development. For those residing in rural settings, for example, transportation problems can pose a barrier to receiving care, and lack of transportation entirely or distance from a provider are common problems, especially when residential treatment options are limited (Hutchison & Blakely, 2010). Residential treatment can be a solution to housing problems for some clients, while others need intensive case management support to help them resolve their transportation problems (Gamm, Hutchison, Bellamy, & Dabney, 2002). Surveys of perceived needs among homeless individuals reveal other barriers to treatment as well. For many homeless individuals, concerns related to finding a job and affordable housing often outweigh concerns related to their addiction or mental illness (Zerger, 2002). A lack of psycho-educational services and family understanding of co-occurring disorders also pose a significant barrier to receiving services (Drake, et al., 2001). Poverty, being uninsured or underinsured, and difficulty adhering to treatment regimens are also cited by the National Coalition for the Homeless (NCH, 2009) as barriers for this complex group. The complexity arises in that problems of homelessness, substance use, and mental illness are interrelated, and each condition can exacerbate the problems associated with the other (Wong et al., 2006). Individuals with co-occurring mental illness and substance related disorders represent a highly vulnerable population with significantly poorer outcomes than individuals with either illness alone (Rach-Beisel, Scott, & Dixon, 1999). Thus, it is critical that treatment programs be able overcome limitations in understanding of this population in order to address these tangible and real needs of these homeless individuals.

The promotion of agencies providing co-occurring treatment is one of the key objectives of Healthy People 2020 (Office of Disease Prevention and Health Promotion [ODPHP], 2010). The agenda includes increasing the number of homeless individuals with mental health disorders

who receive treatment and reducing the frequency of substance use among individuals with addiction disorders. Because of this support at the federal level, many are adopting the belief that models including simultaneous treatment of both mental illness and substance use while addressing housing needs are superior to other models of care (DHHS, SAMHSA, 2010).

Research in the literature however, is not definitive at this time when determining the effectiveness of these models in improving mental health symptomology among this population.

Treatment Outcomes for Population of Focus

A wide variety of models of care have been developed to address the needs of those with co-occurring substance use and mental health disorders who are homeless. Project Excell, an intensive out-patient treatment project developed for homeless males suffering from co-occurring substance use and mental health disorders in Georgia resulted in post-treatment outcomes similar to much more costly residential *Integrated Treatment* projects (Talpade, Talpade, & Lattimore, 2009). Unfortunately, quality program evaluation is costly and difficult to replicate, and experimental and even quasi-experimental designs in project evaluation and research is often underfunded for this population.

Additional barriers to determining effectiveness in treating this sub-population is the lack of a pragmatic design in developing *Integrated Treatment* projects for the homeless, and the diversity of needs as well as the severity of the disorders among homeless individuals with a dual mental health and substance use diagnosis (Padgett, Henwood, Abrams, & Davis, 2008). In an attempt to offer a standardized structured model to address the needs of homeless individuals with substance use and mental health disorders, Kenneth Minkoff, widely known as the leading expert on integrated services, and Robert Drake co-developed the Substance Use and Mental Health Services Administration (SAMHSA) *Toolkit for the Implementation of Integrated*

Services (2009). The defined goal of the integration of services is to “organize the infrastructure of the project to routinely provide matched services ...based on a set of evidenced based principals in the context of an integrated philosophical model” (Minkoff, 2005, p. 110). Integrated services were first used among dually diagnosed homeless individuals within a Continuum of Care (*CoC*) model. While the conceptual model of integrated services within a *CoC* is defined and process evaluations regarding the feasibility of implementation have been conducted (Blakely & Dziadosz, 2007), there are a variety of confounding variables present not included in fidelity ratings of the model such as specific evidence-based interventions, curriculum requirements, and project amenities (Drake, Yovetich, Bebout, Harris, & McHugo, 1997). There are a variety of evidence-based-practices present among integrated *CoC* programs involved in comparison studies. Those found in the literature are: behavioral therapies such as cognitive behavioral therapy, motivational interviewing, and assertive community therapy (Carroll, 2004), strengths based case management (Essock et al., 2006), client centered therapy, trauma informed care (Foster, LeFauve, Kresky-Wolff, & Rickards, 2010), and seeking safety (Najavits, 2004). However, when comparisons of these therapeutic interventions are studied outside of the *CoC* model, they are reported as having no significant differences and negligible effect sizes (Wamplod et al., 1997). Also, treatment effects are cited as confounding within the *CoC* model due to differences in fidelity (Garner, 2009). Additional programmatic variables independent of specific therapies offered that contribute to making project comparisons difficult include: client to counselor ratios, experience and qualifications of treatment staff, varying instrumentation psychometrics, length of project in time, partnerships and community networks available, and the desirability (or lack thereof) of housing among many (Drake, et al., 2001). Further complicating the debate, it has been noted that homeless persons are not a homogeneous

population and differences among homeless people in “age, gender, health status, family composition, living arrangements, number of times homeless, and ethnicity, argue against a single culture of homelessness” (Flaskerud & Strehlow, 2008, p. 1152) while others state that “researchers may feel reasonably comfortable extrapolating [results] to the wider homeless community from homeless clinic attendees” (Stein, & Gelberg, 1997, p. 159). It is because of the need for an affordable option to address the needs of homeless individuals with a dual substance use and mental health diagnosis that new innovative models should be implemented and evaluated for effectiveness. These models should not only address the needs of this vulnerable population, but should also be culturally appropriate for both genders, various age groups, and diverse ethnic groups (Frye et al., 2003; Satre, Chi, Mertens, & Weisner, 2012).

Women in treatment. Women have diverse treatment needs when compared to men (Wizemann, 2001). Prior to the 1970s treatment programs followed a generic approach created predominately for white males. In the years following much attention has been given to the specific needs of women in treatment including the need to include women and minorities in clinical research (Greenfeild & Grella, 2009). Substance use disorders progress differently in women than men. Women tend to progress from misuse to addiction quicker than men, experience greater withdrawal, and experience more relapses (NIDA, 2016). Women do demonstrate however, that they are more likely to remain engaged in treatment when supportive services are provided in the absence of family social supports outside of the program (Ashley, Marsden, & Brady, 2003). The subchapters below will discuss two predominate competing models, *Integrated Treatment* within a *CoC* vs. *Housing First*, and the resulting development of an innovative hybrid model, Arkansas Treatment for the Homeless (ARTH).

***Integrated Treatment* approach within a Continuum of Care (CoC) Model**

The *CoC* model uses a linear “stair step approach” to move individuals through stages of “housing readiness” and hinges on required project compliance with an *Integrated Treatment* approach (Minkoff, 1989) of comorbid mental health and substance use disorders while moving through a networked system of emergency shelters to transitional housing and finally permanent housing. It was established with the intent to coordinate services at the community level to respond to the immediate needs of the homeless population (U.S. Department of Housing and Urban Development [HUD], 2002). Because the co-occurrence of substance dependence and mental illness are often viewed as at least a cyclical if not preliminary condition to homelessness (Dordick, 2002), *Integrated Treatment* is a key component of the *CoC* model because it attempts to treat the whole person through a recovery process that focuses on both addiction and mental disorders and will eventually provide the coping skills necessary to live independently (Wong et al., 2006).

A history of the development of the *Integrated Treatment* approach can be found in *An Integrated Treatment Model for Dual Diagnosis of Psychosis and Addiction* (Minkoff, 1989). It was developed in 1985 in a psychiatric unit of a community general hospital in Boston, Massachusetts. The need for this new approach to be developed arose because the psychiatric unit wanted to improve its psychiatric program while still maintaining the 12-step based addiction program. The number of clients who were simultaneously eligible for both programs was very high. It explained that an integrated approach combining both programs was based on the assumption that both the psychiatric and addiction programs were equally valid when applied separately for patients presenting with one disorder exclusively. However, when applying each to an individual with both disorders, contrasts and obvious parallels between the two programs

justified the integration of the two. Thus, within the context of dually diagnosed homeless individuals, *Integrated Treatment* attempts to address the addiction and mental health needs of the client simultaneously. *Integrated Treatment*'s position within the framework of a *CoC* model supports the housing and social support needs of those individuals. While this model has made great strides in improving the lives of dually diagnosed homeless individuals, disagreement of the efficacy of this model currently exists.

Supporters tout the *Integrated Treatment* approach within a *CoC* model's ability to address the individuals needs in a "one stop shop" fashion utilizing both professional and community resources such as Alcoholics Anonymous (Zerger, 2002). Research generally supports the success of these types of programs especially in substance use outcomes however, design limitations and the complexity of homelessness among this population to be served leave much room for continued research (Brunette, Mueser, & Drake, 2004; Drake et al., 1998; Oakley & Dennis, 1996). The California Institute for Mental Health (2006) reports that few studies have actually compared integrated vs. non-integrated (i.e., services lacking a multi-disciplinary treatment of both addiction and other mental health disorders) on behavioral health outcomes, and of those that did none were of high quality. According to the analysis, three studies supported integrated services, and one did not, but none of these studies included homeless individuals.

Bride, MacMaster, and Webb-Robins (2006) conducted a meta-analysis to compare integrated vs. non-integrated approaches. The results indicated it is unclear whether integrated treatment approaches result in greater improvements in clients' mental health outcomes than non-integrated treatment approaches. While substance use symptom improvements appear to be greater in the *Integrated Treatment* groups, the significance is still questionable due to

inconsistent findings among the studies. In this review, three of the four studies restricted their samples to only homeless individuals while the other only had 2.7% that were homeless.

Another study (Lydecker et al., 2010) using a strictly veteran population with co-morbid depression and substance use disorders indicated that both the integrated vs. non-*Integrated Treatment* approach produced significant improvements in substance use outcomes. However, the participants in the *Integrated Treatment* program maintained improvements over time where the non-integrated program participants had higher rates of recidivism (or relapse) at a one year follow-up. That is, the non-*Integrated Treatment* programs did have significantly higher rates of improvement in depressive symptoms than the *Integrated Treatment* programs at the 6 month follow-up point. Moreover, Milligan et al. (2010) indicated that the benefit of using *Integrated Treatment* vs. non-*Integrated Treatment* is inconclusive at best, if not negligible. Of six studies they reviewed, the overall effect sizes of mental health measures (severity and/or frequency) were not significant among women with children.

While it is clear that individuals with substance use, mental health, and housing problems have a greater need for coordinated services and often have significantly more barriers in accessing and utilizing services available in the community, little is still known regarding effective strategies in reducing the negative effect that mental health problems appear to have on sustained abstinence and recovery when compared with those only displaying substance use problems (McCoy et al., 2003). These disparities are even greater among the homeless with co-occurring disorders (Brunette, et al., 2004). Additionally, other limitations of the *Integrated Treatment* within a *CoC* model are, the expense and feasibility of operating such a large organization (specifically for rural and health shortage areas), a lack of client centered choice and culturally competent practices, and the “all or nothing approach” which can be perceived by

clients as coercive while fostering institutionalization (Drake, et al., 1998). In a published lecture on homelessness and housing models, Szeintuch (2011, p. 408) asserts that “current research provides evidence that to combat homelessness we need to provide services that facilitate social inclusion and minimize exclusion and marginalization.” It is because of these limitations and the highly disproportionate treatment outcomes among the homeless dually diagnosed as well as the “revolving door” of high treatment re-admissions that the *Housing First* model was developed (Tsemberis et al., 2004).

Housing First Model

The *Housing First* model, developed by Sam Tsemberis in 1992, has gained popularity among many treatment providers, clinicians, and substance use researchers over the past decade for numerous reasons. Specifically, this model meets the immediate physical needs of participants without abstinence and/or mental health treatment requirements often found in the “treatment first” *CoC* model (Padgett, Stanhope, Henwood, & Stefancic, 2011). As outlined in Tsemberis’ book, *Housing First: The Pathways Model to End Homelessness for People with Mental Illness and Addiction* (2015), there are three major components of *Housing First*: 1) an emphasis on client choice, 2) having community based services, and 3) permanent housing that is “scattered sited” meaning that it is housing within the general population and not a housing facility for homeless individuals. Therefore, an objective of the *Housing First* model is to overcome discouragement of clients and staff due to the institutionalization and high drop-out and readmission rates witnessed within the *CoC* model of care. This “revolving door” phenomena has been called a “cruel and costly circle of futility” (Padgett, Henwood, & Tsemberis, 2015, p.23). After over two decades of practice, many studies and evaluations of the *Housing First* model exist in the literature and this model has gained credibility with its

designation as an evidence based practice by SAMHSA in 2007. Like the *Integrated Treatment* approach within the *CoC* model, *Housing First* programs have promising outcomes within specific domains and among certain subgroups, but the overall effectiveness of improving outcomes across all three domains of homelessness, substance use and mental health is currently under debate in the literature.

As intended with its design, projects using the *Housing First* model boast exceptionally good outcomes when compared to the *CoC* model on numerous variables such as project retention/completion, housing stability, and reduction in substance use (Pearson, Montgomery, & Locke, 2009). *Housing First* programs also have noted superiority in client satisfaction and reduction in treatment readmissions than *CoC* projects for homeless individuals (Tsemberis, & Asmussen, 1999) but there are often no improvements in psychiatric symptoms (Tsemberis et al., 2004). In a systematic review of studies often cited by *Housing First* supporters, results revealed that differences in substance use lacked sufficient effect sizes while statistically significant. Furthermore, housing stability may be confounded by unrepresentative groups due to sampling error, and mental health improvement is often not significant

when compared to *CoC* model (Kertesz et al., 2009; Leff, et al., 2009). In a randomized controlled trial, *Housing First* had no difference in substance use outcomes, or psychiatric symptomology when compared to the *CoC* model (Padgett, Gulcur, & Tsemberis, 2006). In short, suggestions for the mixed results are: limitations in fidelity to evidence based models, operational definitions of clinical services, and sampling procedures when comparing programs using varying models.

Both *Integrated Treatment* within a *CoC* and *Housing First* Models appear to have promising outcomes in substance use and housing variables however, mental health

improvements appear to be minimal if not null across both models. Both models provide ample evidence of substance use outcome improvements thus neither seems to consistently outperform the other in that area. For housing outcomes, client satisfaction, completion and retention rates, the *Housing First* model appears to have consistently better outcomes than the *Integrated Treatment* within the *CoC* model (Marquardt, 2016). Despite this, the cost and controversy surrounding the permanent supportive housing element of *Housing First* provides barriers at the community level in implementation (Rog et al., 2014).

It is because of the high risk and need of this vulnerable population along with the lack of evidence concretely supporting one superior model that a community health center in Northwest Arkansas developed an innovative “hybrid-design” within its treatment program for homeless substance users with a dual diagnosis. The health center was awarded funding from SAMHSA over the course of a 5 year period from 2004 to 2009 to implement the project. This hybrid model named Arkansas Treatment for the Homeless (ARTH) includes elements of the *Integrated Treatment* approach within a *CoC* model and the *Housing First* model developed by Pathways Inc. (1992).

Innovative Project to be studied: Arkansas Treatment for the Homeless (ARTH)

Innovative models using the elements believed to contribute to the best outcomes from both the *Integrated Treatment* within the *CoC* and *Housing First* models should be researched (Clark, Young, Teague, & Rynearson-Moody, 2016). It is because of this need that the Arkansas Treatment for the Homeless (ARTH) Project in Northwest Arkansas was piloted in partnership with Arkansas’ Division of Behavioral Health Services (DBHS). The ARTH Project was developed by Larry Counts and Nicola Burrows as a cost-effective approach within a Rapid Cycle Quality Improvement effort to reduce readmissions due to reoccurring substance use

problems, mental health symptomology, and housing needs of clients. The project was supported in kind by SAMHSA because of its use of evidence based practices and fiscally responsible principals. This project was primarily a *CoC* model with an integrated approach in that it provided a multidisciplinary team for each participant and housing support in the form of transitional housing. What makes this project innovative however, is that each client was able to choose an “out of network” case management and mental health provider without the sobriety contingencies placed on the housing component concurrent with the philosophy of the *Housing First* model. In general, the ARTH project was designed to meet the needs of this sub-population while combining the positive effects of *Integrated Treatment* within *CoC* and *Housing First* models in a cost effective innovative approach. The pilot project was implemented in order to provide evidence based services known to improve substance use and housing outcomes while improving mental health symptomology among those substance dependent homeless individuals with a co-occurring mental health disorder.

Population of focus and subpopulations. The primary population of focus of this project were individuals who experienced chronic homelessness, and have a dual substance use and mental health diagnoses in Northwest Arkansas. The individuals receiving services had both substance use and/or co-occurring substance use and mental health disorders. As noted in the following section, this population has complex, unique and multi-faceted treatment needs. In addition, there are many general needs and service gaps in Northwest Arkansas for homeless individuals, and a lack of stable housing.

The geographic area served was the urban, suburban and rural, economically underserved, health shortage area of Northwest Arkansas. The area includes four diverse counties. In 2010, Benton County had a population of 221,344, and a population estimate of

237,297 for 2013. Washington County had a population of 203,060 and was estimated to have at 6.6 percent growth by 2013 to 216,410. Carroll County's population as of 2010 was 27,446 and had a projected growth of 1.3 percent by 2013. Madison County was projected to decrease by 0.1 percent from 15,117 in 2010 to 2013. The total catchment area population is estimated to be 500,000 people.

Description of regional demographics and culture. According to the U.S. Census Bureau, the 2013 population estimate for the state of Arkansas was 2,959,373 (an increase of 1.5% from the 2010 census). Arkansas residents overall have a higher poverty rate (16.7%) when compared to the United States average (14.9%), and when looking at the rural counties, the poverty rate jumps to 20.1%. The same trend applies to high school non-completion rates.

Extent of need. On the basis of estimates from the SAMHSA-sponsored 2009 National Surveys on Drug Use and Health (NSDUH), substance use problems in Northwest Arkansas generally exceed state and national averages. The NSDUH survey consisted of 51,118 interviews from a stratified sample. Data from the 2008-11 NSDUH are available at the sub-state level and the results indicate that these areas have a greater need than both the state and region on all but one indicator (see Table 1, pg. 24). There is an ever-growing challenge to meet the needs of an increasing homeless population in Northwest Arkansas (Fitzpatrick, Collier, & O'Conner, 2015). Targeting Washington and Benton Counties in the 2011 point-in-time census, there was a reported homeless population of 2,429 persons living in shelters, homes of friends and relatives, and outdoors. This number increased by 18 percent since the last point-in-time census in 2009.

Table 1

Substance Treatment Needs for Adults Based on NSDUH Data

	ARTH Area	Arkansas	Southern States
Illicit drug use past month	7.9%	7.4%	7.5%
Alcohol dependence / use past year	7.2%	6.5%	7.0%
Illicit drug dependence or use past year	2.9%	2.5%	2.5%
Needing but not receiving txt for alcohol	6.6%	6.1%	6.6%
Needing but not receiving txt for drugs	2.4%	2.2%	2.2%
Had a major depressive episode	8.4%	7.6%	6.4%

Note: ARTH = Arkansas Treatment for the Homeless; Southern states include: Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Alabama, Georgia, Florida, Kentucky, Tennessee, Virginia, West Virginia, North Carolina, and, South Carolina.

The ARTH project will be explained in greater detail in chapter three. A description of the project site, the treatment models and approaches used, and the clinical process of the project will be included. Chapter three will also include a description of the selection and recruitment process into the project.

Project goals. The primary goals of the project focused on clinical and housing needs of the population through a hybridization of both the *Integrated Treatment CoC* model and *Housing First* model. Goals identified within this innovative treatment project were drawn from the identified needs of the region and target population, best practice models, and research of homeless persons who meet substance use, or co-occurring substance use, or mental illness criteria. Goals and objectives of the ARTH project include:

1. Integrate treatment and services for substance use, co-occurring substance use and/or mental illness.

2. Provide client choice of case management and mental health provider.
3. Secure permanent housing for the homeless population of focus in Northwest Arkansas, while providing acute housing within the *CoC* model.
4. Improve mental health treatment outcomes for project participants.
5. Reduce existing treatment disparities among demographic minorities including women.

Inclusion criteria. Individuals accepted into the project were adults (age eighteen and above) with both an AXIS I substance use and mental health diagnosis who also met the federal definition of chronic homelessness at the time of intake. Chronic homelessness is defined by HUD as having been continuously homeless for a year or more and/or has had four episodes of homelessness in the last three years. The United States office of Housing and Urban Development (HUD) defines “homelessness” as “sleeping in a place not meant for human habitation” (e.g. living on the streets for example OR living in a homeless emergency shelter).

Project innovation/ transitions in modalities. Many of the above services, practices, and curricula are common practice in many treatment programs using Integrated *CoC* models. The innovative approach of this project however, is that case management and mental health services are delivered by the out of network provider of choice of the client. At intake into the ARTH program the client chooses from a list of network providers of case management that will serve as the client liaison throughout the project regardless of status within each individual service component. For example, if a client is discharged for “non-compliance” from substance use treatment, case management services are still available. Similarly, mental health treatment is provided by a clinician of the client’s choice and will not be discontinued in cases where housing services or substance use treatment are terminated. This is different from a *CoC* model in that service interruption from one provider will not necessarily mean service interruption from all

providers. However, the project does use service integration in that all members of the team (i.e., service providers) participate in bi-weekly staffing and treatment plan reviews for the client.

Services provided and evidence based practices/curriculum. The ARTH program was designed as a second phase within a continuum of care where the acute treatment needs of clients have already been met. Clients accepted into the ARTH program received acute substance use detoxification when needed and inpatient substance use treatment prior to admission into the ARTH phase. ARTH offered outpatient counseling for mental health, case management services, aftercare, and housing services that provide temporary housing with clients moving into permanent housing. Evidence based curricula that were provided were: *Living in Balance* and *Seeking Safety*. Motivational Interviewing was also used specifically by all mental health and case management staff. These specific evidence based practices and curricula were chosen due to their appropriateness and evidence of outcome improvements in homeless individuals with dual diagnoses and listed in SAMHSA's National Registry of Evidence-based Programs and Practices (NREPP). Fidelity monitoring to all evidenced based practices was conducted and any deviations were reviewed monthly and incorporated into the rapid cycle quality improvement process in order to keep fidelity consistent across the project timeline.

Living in Balance (LIB). It emphasizes relapse prevention. *LIB Moving from a Life of Addiction to a Life of Recovery* is a manual-based, comprehensive addiction treatment curriculum consisting of a series of 1.5- to 2-hour psychoeducational and experiential training sessions. The manual includes 12 core and 21 supplemental sessions. Ten additional sessions addressing co-occurring disorders were used. *LIB* was delivered in group settings with relaxation exercises, role-play exercises, discussions, and workbook

exercises. The psychoeducational sessions cover topics such as drug education, relapse prevention, available self-help groups, and sexually transmitted diseases (STDs). The interactive, experientially based sessions are designed to enhance the participant's level of functioning in certain key life areas often neglected with prolonged drug use: physical, emotional, social wellbeing, adult education opportunities, vocational development, daily living skills, spirituality/recovery, sexuality, and recreation/leisure. These sessions included a large amount of role-play with time to actively process personal issues and learn how to cope with everyday stressors. The *Living in Balance* (LIB) curriculum has been included in SAAMHSA's NREPP, *and* was originally tested as part of a National Institute on Drug Use (NIDA)-funded project entitled Strategies to Enhance *CoC* model Treatment Programs and Outpatient Retention (SECTOR).

Seeking safety. It is a curriculum for participants with a history of trauma and substance use. It focuses on coping skills and psychoeducation and provides effective treatment for post-traumatic stress disorder (PTSD) and substance use. The treatment is designed for flexible use: group or individual format, male and female participants, and a variety of settings (e.g., outpatient, inpatient, residential, etc.). The treatment manual providing both participant handouts and guidance for clinicians is available in both English and Spanish. According to NREPP (2006), *Seeking Safety* has been tested with dually diagnosed women, men, and adolescent girls, Hispanic women and veterans.

Motivational interviewing. This is an evidence-based treatment approach that provides counselors with techniques to help them engage and retain participants in treatment and support participants' self-efficacy. The focus is on helping participants explore and resolve ambivalence, and enhance their motivation to reduce substance use and make other

positive changes in their lives. These changes occur in five stages: pre-contemplation, contemplation, preparation, action, and maintenance (Prochaska & Norcross, 2001), with each involving different time frames, levels of motivation, and treatment strategies.

Because this type of project including the above evidence based practices and hybridization of two competing models of care has never been studied, it is important to understand its effectiveness in improving clinical outcomes. Efforts to create programs that improve the lives of dually diagnosed homeless individuals have resulted in the development of varying models of care. While both the *CoC* model using an *Integrated Treatment* approach and the *Housing First* model have promising outcomes compared to no treatment at all, neither model appears to outperform the other across all variables of housing status, substance use, and mental health symptomology simultaneously. *Housing First* has consistently better housing and satisfaction outcomes compared to *CoC* however, mental health outcomes are worse. *CoC* model programs have better mental health outcomes but housing outcomes and retention rates are much lower in comparison to *Housing First*. Both *CoC* and *Housing First* appear to have similar substance use outcomes.

It is because of this that an innovative project in Northwest Arkansas combined elements from each in an attempt to improve outcomes across all domains. The ARTH project uses 1) an *Integrated Treatment* approach, 2) the *CoC* model for stages of housing and requirement treatment, and 3) *Housing First* philosophy in client choice of case management and mental health provider as well as sustained treatment and housing availability in cases of relapse rather than discharge. The original evaluation report as required by the funding agency, SAMHSA, included repeated measures t tests from intake into ARTH to 6 months post intake and showed significant improvements in substance use and housing status. It did not however include

measures of mental health improvement although the data were collected. It is this gap in knowledge that lead to the proposal this study of secondary data analysis of the mental health outcomes for project participants.

Original reported ARTH program evaluation. The funding agency (SAMHSA) required a descriptive evaluation of program participants and substance use, housing situations, and fidelity of service delivery. A total of 173 clients agreed to enroll in the original evaluation study of the ARTH program. Program participants were predominantly white (94.2%) and Male (64.3%). Approximately half of program participants had never completed high school (49.3%) and half (51.4%) having had multiple occurrences of chronic homelessness (having been homeless for 12 consecutive months) prior to entry into the program. Client substance use and housing outcomes were promising. Specifically, clients had a statistically significant decrease in both alcohol and drug use and a significant increase in housing satisfaction (unpublished SAMHSA report, 2010). Additional secondary analyses however, was necessary to understand how participation in the ARTH program affected mental health functioning.

Chapter Three: Method

Participants

Target Population and Sample. The target population for this secondary study was all ARTH program evaluation participants. A total of 173 clients participated in the original program evaluation. Of those that participated in the original evaluation, 158 (91%) completed interview surveys at both the intake and 6 month follow-up interview. A total of 121 participants completed interviews at all three time points: intake into the program, three months post intake, and six month follow-up which was approximately 70% of all total program participants.

Table 2

Characteristics of Secondary Analysis Participants (N = 121)

	<i>n</i>	%
Race		
White	114	94.2
African American	3	2.5
Other (Asian, Native Hawaiian, or other)	4	3.3
Gender		
Male	82	67.8
Female	39	32.2
Age		
18 - 39	69	57.0
40 and Above	52	43.0

Measures

Demographic survey. Along with locator data, a demographic form was included as part of participants' admission to ARTH project in order to collect information on general demographics. Gender, race, ethnicity, and age demographics were collected.

Brief symptom inventory (BSI). The BSI (Derogatis & Melisaratos, 1983), is a brief psychological self-report symptom scale in which participants marked responses on a 5-point Likert-type scale to indicate how much they have been bothered (0 = *Not at All*, 1 = *A Little Bit*, 2 = *Moderately*, 3 = *Quite a Bit*, and 4 = *Extremely*) by various psychiatric distress in the past week (i.e., 7 days). It includes 53 items, which is the shortened version of the Symptom Checklist-90 Revised (SCL-90-R, Derogatis, 1977), and measures nine primary symptom dimensions (i.e., somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism). Three global indices of distress (i.e., global severity index [GSI], positive symptoms total [PST], and positive symptoms distress index [PSD]) were also provided. The BSI illustrates the psychological symptom patterns of individual subjects including those reflecting psychological and/or medical abnormalities as well as “normal” or healthy individuals. The BSI is suited for adult and adolescent ages 13 and above with appropriate reading skills (Derogatis, 1993). The positive symptom total (PST) is described as ‘the most sensitive’ in detecting overall discomfort and is obtained by counting the frequency of items with a positive response for a total score. This study used the PST to identify the existence and degree of psychological distress among participants. PST scores range from 0 indicating no symptomology, to 53 indicating the highest level of distress (i.e., respondent report at least 1 or above for all 53 items).

The BSI has good reliability and validity. Internal consistency reliabilities derived from Cronbach’s alpha range from a low of .71 on psychoticism to a high of .83 on the Obsessive-Compulsive dimension and test retest reliability of $r_{tt} = .80$ on the PST scale among adult psychiatric outpatients (Derogatis, 1993) and $r_{tt} = .96$ among young adult non-patients below the age of thirty (Kellett, Clarke, & Matthews, 2007). For this sample of 121 participants, internal

consistency reliability from Cronbach's alpha ranged from .74 on the Phobic Anxiety dimension to .87 on the Obsessive-Compulsive dimension. The PST also has a strong test retest coefficient of .90 and convergent validity correlation of .85 between like symptom dimensions of the SCL-90-R (Derogatis, 1993).

Social Support at intake into the program. The presence of social supports outside of the program was measured with one item during the intake interview. Participants were asked "Do you have someone outside of the program that you can talk to or turn to in times of trouble? This could be family, friends, clergy, sponsor, or anyone else outside of the program that you can talk to." The variable is dichotomous with yes or no as the possible response options.

Data Analysis

The analyses included a descriptive analysis of demographics and problem severity at baseline, three months post intake, and the six month follow-up point for mental health symptomology as scored by the PST. As expected there was a violation of the normality assumption of PST scores; the Kolmogorov-Smirnov test was used to test for normality (Manikandan, 2010). Using Templeton's (2011) transformation procedure, a two-step approach was used. Transforming data consisted of creating uniformity using the percentile rank function, and then applying the inverse normal distribution function to achieve normality. Comparisons between the three time points on mental health symptomology were analyzed using SAS 9.4 (SAS Institute, 2013). A repeated measures design, which contains a between-subjects factor and a within-subjects factor (Maxwell & Delaney, 2004) was used in this study and multivariate analyses of variance (MANOVA) was conducted to test improvements in PST scores as a function of time as well as other between-subjects functions within the project. Specifically, differences in mental health functioning across the three time points were evaluated by

demographic factors of gender, social support as determined by self-report at intake into the program, and age.

Chapter IV: Results

The purpose of this study was to explore the effectiveness of ARTH on improving mental health symptomology among homeless substance users with a co-occurring mental health disorder. Study participants served as their own controls with mental health improvement being measured by the Brief Symptom Inventory's Positive Symptom Total (PST) score as a function of time in the program. MANOVA was used to test differences in mental health functioning across time in the program between participants' gender, social supports, and age. When descriptive cross tabulations were conducted, many cells were greatly disproportionate in size and some had very few cases. As seen in Table 3, tests of normality were violated for PST scores across all three time points. The Kolmogorov-Smirnov test was significant at each time point: PST at intake $p = .02$, PST at 3 month follow-up $p < .001$, and the PST at 6 month $p < .001$.

Table 3

Descriptive Statistics of Pre-Transformed PST Scores (N = 121)

	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>
PST Intake	23.31	13.12	.29	-.76
PST 3Month	20.31	13.97	.37	-.91
PST 6Month	19.68	14.40	.44	-.90

Because of the non-uniformity, a two-step approach to transforming data consisting of creating uniformity using percentile ranking and then applying an inverse normal distribution function was used (Templeton, 2011). After data transformation normality was achieved. The Kolmogorov-Smirnov test was not significant at each time point: PST at intake $p = .85$, PST at 3 month follow-up $p = .84$, and the PST at 6 month $p = .06$. Descriptive results were reported in

each section below before data were transformed. However, all inferential analyses (i.e., MANOVAs) were conducted on the data after transformation. The three independent variables each consist of two levels: male vs. female, access to external social supports vs. no access to external social supports, and age (i.e., 18 to 39 vs. 40 and above) at intake.

Gender and Time

A MANOVA was conducted on the transformed data (Templeton, 2011) to assess the gender effect on participants' scores on the PST scale of the Brief Symptom Inventory across three time periods (i.e., pre-intervention, post-intervention [3-month], and follow-up measurement [6-month]). The descriptive results are presented in Table 4. Although women tend to have more negative symptoms at intake and three months post intake than men and less at the six month follow-up, there was no significant interaction between gender and time, $F(2, 238) = 2.43, p = .12$ (see Figure 1 for graph of time by gender plots of transformed data) as well as the gender main effect, $F(1, 119) = .37, p = .55$. However, the time main effect was significant with a moderate effect size, $F(2, 238) = 14.06, p < .001$, partial $\eta^2 = .11$.

Table 4

Descriptive Statistics: PST Scores by Gender x Time

	<i>N</i>	Intake		3 Month		6 Month	
		<i>M(SD)</i>	<i>TR_M(SD)</i>	<i>M(SD)</i>	<i>TR_M(SD)</i>	<i>M(SD)</i>	<i>TR_M(SD)</i>
Male	82	23.08(13.75)	22.6(13.37)	19.34(14.24)	18.88(13.71)	20.40(15.05)	20.11(14.34)
Female	39	23.90(11.84)	24.73(11.17)	22.36(13.33)	22.30(12.10)	18.15(13.00)	18.71(12.41)
Total	121	23.31(13.12)	23.29(12.70)	20.31(13.97)	19.98(13.26)	19.68(14.40)	19.66(13.77)

Note: Original means and standard deviations are in bold; TR_M (SD), is the mean and standard deviation after data transformation.

As illustrated in Figure 1, there is a clear inverse relationship between psychological distress and time in the program. As time in the program increases, psychological distress decreases as measured by the PST. With gender included in the model, pairwise comparisons for the significant time effect were conducted. After Bonferroni corrections the alpha level was set to $\alpha = .017$. Post-hoc comparisons reflect a significant difference between intake into the program and the six month, $p = .002$. Differences between intake and the three month post intake, $p = .06$, and from three months post intake to the six month follow-up, $p = .16$ were not significant.

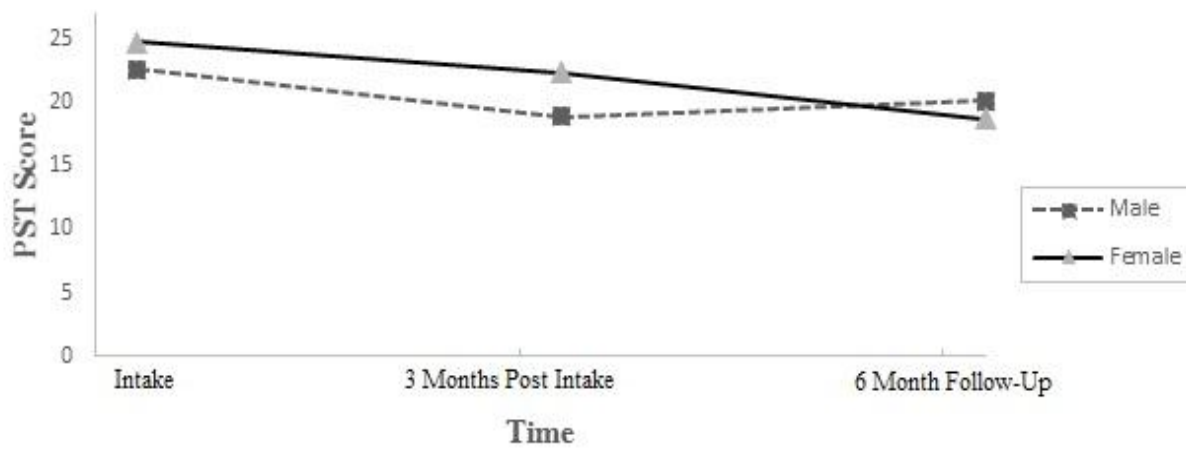


Figure 1. Transformed PST score change by gender as a function of time after intake into the program. Although the possible range of PST scores are from 0 to 53, the range was restricted in order to see the small difference between groups on graph. Higher scores represent a greater level of psychological distress.

Social Support and Time

Again, using the transformed data, A MANOVA was conducted to assess the social support effect on participants' scores on the PST scale across three time periods (i.e., pre-intervention, post-intervention [3-month], and follow-up measurement [6-month]). The non-transformed results are shown in Table 5. There was no significant interaction between social

supports and time, $F(2, 238) = .24, p = .78$. See Figure 2 (pg. 38) for graph of time by social groups plots of transformed data. The main effect of social support was not significant, $F(1, 119) = .28, p = .56$ thus failing to reject the null hypothesis of a social supports effect.

Table 5

Descriptive Statistics: PST Scores by Social Supports \times Time

	<i>N</i>	<u>Intake</u>		<u>3 Month</u>		<u>6 Month</u>	
		<i>M(SD)</i>	<i>TR_M(SD)</i>	<i>M(SD)</i>	<i>TR_M(SD)</i>	<i>M(SD)</i>	<i>TR_M(SD)</i>
No SS	80	24.00(13.12)	23.96(12.46)	20.49(13.83)	20.33(13.33)	20.01(14.38)	19.82(13.99)
SS	41	21.95(13.16)	21.91(13.22)	19.98(14.40)	19.26(13.25)	19.02(14.61)	19.34(13.50)
Total	121	23.31(13.12)	23.29(12.70)	20.31(13.97)	19.98(13.26)	19.68(14.40)	19.66(13.77)

Note. No SS = without social support during the intervention period; SS = with social support during the intervention period. Original Means and Standard Deviations are in bold; TR_M (SD), is the Mean and Standard deviation after data transformation.

There was not an overall difference between groups on the mean differences in PST across time, suggesting that the treatment had equal effects of mental health improvement for regardless of external support available. The main effect for time was significant with a moderate effect size, $F(2, 238) = 5.67, p = .004$, partial $\eta^2 = .09$. Using measures across time as a proxy for treatment effect, both groups had an overall reduction in negative mental health symptomology. With social supports groups included in the model, pairwise comparisons for the significant time effect were conducted. After Bonferroni corrections the alpha level was set to $\alpha = .017$. Post-hoc comparisons reflected a significant difference between intake into the program and the three month follow up on PST scores, $p = .005$, as well as significant differences between intake and the six month follow-up, $p = .004$. Differences in PST scores between the three month follow-up and the six month follow up, $p = .85$ were not significant. .

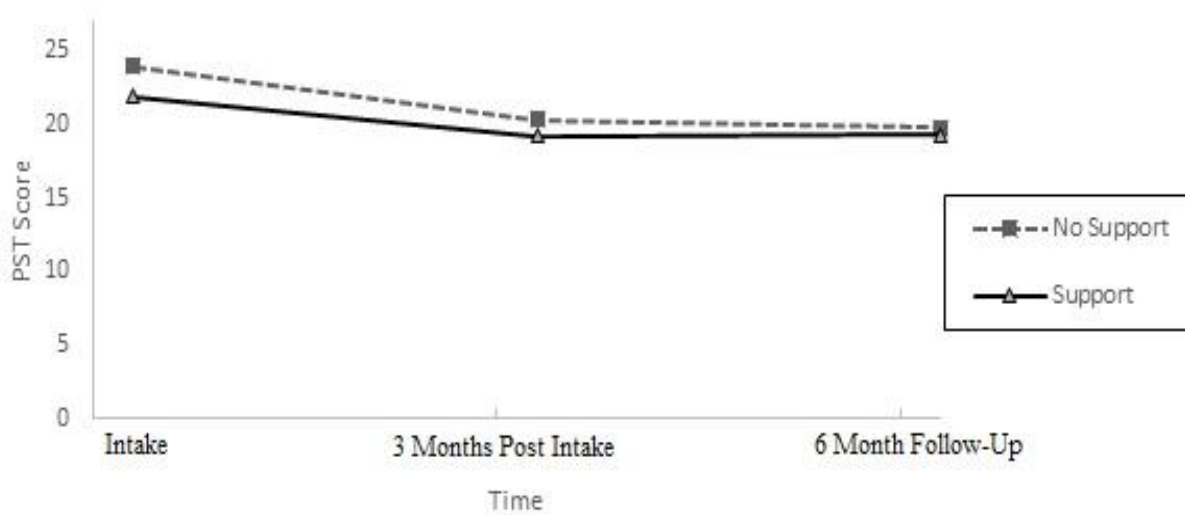


Figure 2. Transformed PST score change by social support as a function of time after intake into the program. Although the possible range of PST scores are from 0 to 53, it was restricted in order to see differences between groups on graph. Higher scores represent a greater level of psychological distress.

Age and Time

Similarly, a MANOVA was conducted on the transformed data (Templeton, 2011) to assess the age effect on participants' scores on the PST scale across three time periods. The non-transformed results are shown in Table 6. There was no significant interaction between age group and time, $F(2, 238) = .41, p = .67$. See Figure 3 for a graph of time by age group plots of non-transformed data. The main effect of age was not significant, $F(1, 119) = 1.40 p = 0.24$, thus failing to reject the null hypothesis of an age effect.

Table 6

Descriptive Statistics: PST Scores by Age x Time

Age	N	Intake		3 Month		6 Month	
		<i>M</i>(<i>SD</i>)	<i>TR_M</i> (<i>SD</i>)	<i>M</i>(<i>SD</i>)	<i>TR_M</i> (<i>SD</i>)	<i>M</i>(<i>SD</i>)	<i>TR_M</i> (<i>SD</i>)
18 – 39	69	21.86(13.46)	21.90(13.36)	19.29(13.34)	19.34(13.34)	18.61(14.63)	18.50(13.81)
40 and up	52	25.23(12.52)	25.17(11.61)	21.67(14.78)	20.84(13.24)	21.09(14.11)	21.30(13.70)
Total	121	23.31(13.12)	23.29(12.70)	20.31(13.97)	19.98(13.26)	19.68(14.40)	19.66(13.77)

Note: Original means and standard deviations are in bold; *TR_M (SD)*, is the mean and standard deviation after data transformation.

There was not an overall difference between age groups on the mean differences in PST across time, suggesting that the treatment had equal effects of mental health improvement for both groups. Also consistent with previous models, the multivariate effect of time was significant and had a moderate effect size, $F(2, 238) = 7.46, p = .001$, partial $\eta^2 = .12$.

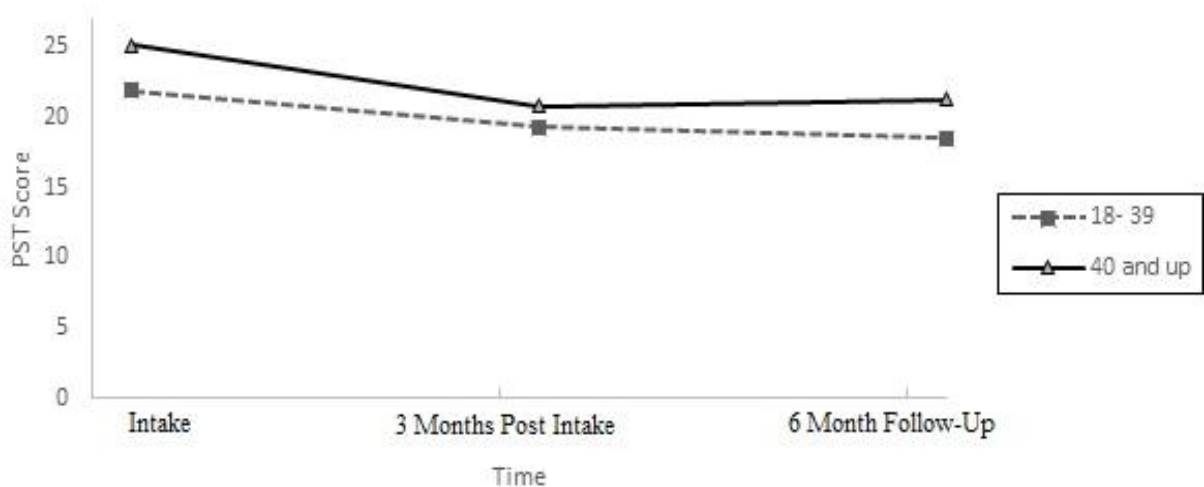


Figure 3. Transformed PST score change by age group as a function of time after intake into the program. Although the possible range of PST scores are from 0 to 53, it was restricted in order to see differences between groups on graph. Higher scores represent a greater level of psychological distress.

Using measures across time as a proxy for treatment effectiveness, both age groups had an overall reduction in negative mental health symptomology. With age group included in the model, pairwise comparisons for the significant time effect were conducted. After Bonferroni corrections the alpha level was set to $\alpha = .017$. Post-hoc comparisons reflected a significant difference between intake into the program and the three month follow up on PST scores, $p = .001$, as well as significant differences between intake and the six month follow-up, $p = .001$. Differences in PST scores between the three month follow- up and the six month follow up, $p = .84$ were not significant. Levenes' test of equality of variances supported the assumptions of equal variances.

Chapter V: Discussion

This study examined the impact of the Arkansas Treatment for the Homeless program (ARTH) on mental health symptomology among a sample of homeless substance use clients with a co-occurring mental health diagnosis. The 121 participants consisted of adult males and females who met the federal definition of being chronically homeless, which is to be homeless for over one year or to have had at least four prior episodes of homelessness. Participants served as their own controls in a repeated measures design. All participants were enrolled in the ARTH program and were followed for a course of six months with data collection points at intake, three months post intake, and a six month follow-up. A total of 121 participants completed the intake, three month post intake, and the six month follow-up interview thus providing an adequate sample size for MANOVA to test several between-subjects effects (i.e., gender, social support, and age) on mental health improvement as a function of time in the ARTH program. Overall, results indicated both between-subjects and interaction main effects were not statistically significant. However, time main effects were significant among all conditions. The following sections outline the results of each hypothesis test and a discussion of their implications.

Hypothesis I. There will be a statistically significant difference in the number of mental health symptoms as measured by the PST across time between gender groups.

It was hypothesized that there would be a significant difference in psychological distress between male and female participants across time in the program. This hypothesis was derived from existing gender gaps in treatment outcomes as cited in the literature review (Ashley, Marsden, & Brady, 2003). Gender specific therapy groups were offered by licensed mental health professionals as a part of the required mental health component of the program. These interventions were expected to eliminate any interaction effect of gender on the degree on PST

score improvement over time in the program. While there was no interaction effect between genders, this study did not support the hypothesis that males and females would differ across time on psychological distress after participating in ARTH. While females had slightly higher PST scores (indicating higher psychological distress) than males at intake and the three month follow-up, they were lower on average at the 6 month follow-up (see Figure 1, pg.36); however differences between males and females and across times were not significant. The transformed data were used in the MAONVA analysis, however, the original PST means represent the clients' mental health symptomology (Osborne, 2002).

These results are promising in that there is no existing disparity in mental health improvement between genders across time in the ARTH program. It is important to note however that the data show there was likely no existing disparity at the time of entry into ARTH. Because of this, contamination from previous acute care is a concern, and the program itself cannot be accredited with reducing the gender gap, but maintaining that "bridge" across time in the program. Post-hoc comparisons are also promising however, in that while there were no differences between the intake and three month scores or the three month and six month follow-up PST scores, there were significant improvements from intake to the six month follow-up. Scores on average, decreased nearly an additional five points from intake into ARTH to the six month follow-up point.

Hypothesis II. There will be a statistically significant difference in the number of mental health symptoms as measured by the PST across time between those that have social supports outside of the ARTH program and those that do not across time in the program.

It was hypothesized that there would a significant difference PST scores between social support groups across time. This hypothesis was derived from the importance of social supports

in treatment outcomes as indicated in the literature (Dobkin, Civita, Paraherakis, & Gill, 2002; Sharp & Getz, 1998; U.S. Department of Health and Human Services [HHS], Substance Use and Mental Health Services Administration, [SAMHSA] 2010). Results of this study did not support this hypothesis thus the null hypothesis is retained. As anticipated, those that were not externally socially supported had slightly higher levels of psychological distress across all three time points. However, differences between with and without external social support groups across times were not statistically significant. Although the transformed data were used in the MAONVA analysis the original PST means generally represent the clients' mental health symptomology (Osborne, 2002).

These results are promising in that there is no existing disparity in mental health functioning between social support groups across time in the ARTH program. As indicated by the plots, there was no interaction between social support and time in the program (see Figure 2, pg. 38). However, one reason for the results may be due to contamination. Because ARTH was an intervention along a continuum of care, previous diagnoses and treatment for mental health problems are likely to have provided a social support structure prior to coming into the ARTH program. Post-hoc comparisons are also promising in that while there were no differences in the three month post intake and six month follow- up PST scores, improvements in mental health functioning from intake to the three month post intake were maintained to the six month follow-up. Scores on average, decreased over four points from intake into ARTH to the six month follow-up point.

Hypothesis III. There will be a statistically significant difference in the number of negative mental health symptoms as measured by the PST between those adults age 18 to 39 and those 40 and above across time in the program.

It was hypothesized that there would be a significant difference in psychological distress as measured by the PST between those adults ages 39 and under and 40 and above. The program interventions were selected due to the evidence of appropriateness for adults of any age across multiple life transitions. While there was no interaction effect between age groups, this study did not support the hypothesis that the main group effect would differ across time on psychological distress. Those that were age 18 to 39 had slightly lower PST scores (i.e., indicating less psychological distress) than those that were 40 and above, scores were not significantly different across all three time points in the program (see Figure 3, pg. 39) however, and thus the null hypothesis was retained. Although the transformed data were used in analysis and interpretation must be made with caution, however, the reduced means represent improvement in mental health functioning (Osborne, 2002).

A reason for the lack of difference between the age groups may be due to contamination. It may also be that confounding life transitions were not able to be controlled for in this secondary data analysis. Because the ARTH program was the second phase within a continuum of care, the acute phase may have already been successful in reducing the hypothesized disparity among the groups. These results are promising in that there is no existing disparity in mental health improvement between age groups across time in the ARTH program. Post-hoc comparisons are also promising in that while there were no differences in the three month and six month follow-up PST scores, improvements in mental health functioning from intake to the three month were maintained to the six month follow-up; four points from intake into ARTH to the six month follow-up point on average.

Implications

The Arkansas Treatment for the Homeless (ARTH) pilot project was an *Integrated Treatment* model providing a multidisciplinary team for each participant and housing supports in the form of transitional housing. What made this project innovative, is that each client was able to choose an “out of network” case management and mental health provider who would remain available without contingency on compliance with the substance use and housing services. Evidence based curricula were chosen for appropriateness for adults of both genders. The original evaluation study revealed that overall substance use treatment outcomes were good with participants improving from intake to 6 months post intake. What was lacking in the initial evaluation (unpublished SAMHSA report, 2010) of program effectiveness however was mental health functioning of participants, one of the primary goals of the program.

This study explored the effectiveness of ARTH on improving mental health symptomology among homeless substance users with a co-occurring mental health disorder. Study participants served as their own controls with mental health improvement being measured by the Brief Symptom Inventory’s Positive Symptom Total (PST) score as a function of time in the program. Tests of differences in mental health functioning across time in the program between participants’ gender, social supports, and age revealed no significant interaction or main effects between any of the groups. The overall effect of mental health improvement over time was significant in all models.

Based on the findings of this study, the ARTH program was found to be a successful intervention for reducing mental health outcomes. This study’s results could support positive social change by:

- 1) Devising a cost effective treatment model that reduces the number of homeless individuals with a co-occurring disorder that go without treatment.
- 2) Improving the overall health of those who benefit from the program.
- 3) Reducing stigmatization and institutionalization of clients while maintaining positive mental health outcomes.
- 4) Decreases in the disparities currently present in treatment outcomes among minority subpopulations.
- 5) Decreases in the use of resources for social, health, and legal services that is disproportionately spent on this population.

Limitations and Future Recommendations

These results are exciting in that where disparities were expected to occur they were not significant. Caution however must be used when interpreting the results to the treatment effect without addressing confounding variables. A number of considerations should be made in future studies.

- 1) In future studies a control group receiving “treatment as usual” to compare to the ARTH group would improve confidence in results. Random assignment or propensity score matching to control for differences at baseline into the two groups would eliminate potential selection bias.
- 2) Another important variable to consider would be that the existing ARTH program exists within a continuum of care. Program outcomes are likely to be contingent on fidelity to services provided in the more acute stages of treatment which was not addressed in this study.

- 3) A larger sample should be collected where all main effects could be included in the model simultaneously without compromising cell size.
- 4) Access to clinical files where controls for service utilization beyond self-reports and baseline data at entry into acute services would provide greater insight to program success.
- 5) Access to clinical files where primary mental health and substance use diagnoses would allow for comparison of treatment outcomes across diagnostic groupings would better inform practice improvement.

Summary

The purpose of this study was to explore if mental health functioning among homeless individuals with a co-occurring substance use and mental health disorder was impacted by participation in the Arkansas Treatment for the Homeless program. Hypotheses sought to investigate if ARTH would positively impact mental health functioning over time in the program as assessed by the PST of the Brief Symptom Inventory. Results indicated that the use of this innovative intervention could facilitate statistically positive changes in mental health functioning as measured by the PST. Hypotheses explored the difference between groups by gender, availability of social supports, and age services on mental health functioning over time in the program. Results of the study found no significant differences between the groups for any of the comparisons over the three intervals (Intake, three month post intake, and 6 month follow-up). Suggestions for this finding include, ARTH program effectiveness in reducing disparities among these groups, elimination of disparities by previous acute care rather than the ARTH program, or sample bias.

While acknowledging the limitations in generalizability of this study, results support that the ARTH program may be an effective intervention in improving mental health functioning of participants while also providing access to substance use treatment and housing supports. The program was a cost effective means for including evidenced based practices and innovative strategies to provide the complex array of services that this population needs. Additional research should include variables of fidelity to acute stages of treatment, baseline information at the acute stage, and clinical indicators in a randomized experimental design to explore generalizability of these results.

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APPENDIX I: INFORMED CONSENT FORM

Project Title: Arkansas Treatment for the Homeless Study

Institution: University of Arkansas for Medical Sciences

Funding Agency: Substance Use and Mental Health Services Administration

You are being asked to participate in a research study that is designed to evaluate the effectiveness of the Arkansas Treatment for the Homeless Project. The Principal Investigator for this study is Nicola A Conners, PhD. The study is being conducted through a partnership between DBHS and the College of Medicine, Department of Pediatrics at the University of Arkansas for Medical Sciences (UAMS).

Purpose of the Study: The purpose of this study is to evaluate the effectiveness of the Arkansas Treatment for the Homeless Project, and to help provide more effective services to men and women who have experienced homelessness. We are interested in collecting information from you because you are enrolled in the Arkansas Treatment for the Homeless project. All clients entering the project are invited to participate in the study. Your participation in the study is completely voluntary and will not impact your ability to receive services at UAMS.

Duration of the Study/ Procedures: All clients who agree to participate in the study will be asked to take part in three interviews over the course of six months. These interview times are listed in the table below, along with the approximate length of each interview and the amount of compensation we will offer you for your time.

Intake	3 months after intake	6 months after intake
2 hours	1 hour	1 hour
No compensation	\$10 Walmart Gift Card	\$10 Walmart Gift Card

As part of this study, you will be asked many questions. We will ask questions about your personal background, services you have received, your experience with drugs (including alcohol and tobacco), and your housing stability, income and employment, satisfaction with treatment, legal issues, and family and social relationships.

Because your information is important, we want to collect information from you regardless of where you are living after you leave treatment. Even if you become incarcerated or are on parole during the course of the study, we would still like you to participate in the study. If you become incarcerated, either in a county jail or a state or federal prison, a research assistant will try to visit you to complete your normally scheduled assessment. However, you should understand that your participation in the study will have no effect on your status as a prisoner, your class, job assignment or parole steps. No information about your participation will be provided to a parole board. Your participation in the study is always voluntary, and even if you become incarcerated or are on parole, you are free to withdraw your participation at any time.

Confidentiality : Every effort will be made to keep confidential the information that you provide. You will not be identified in any reports of this project except by a code number. Only the UAMS research study staff, the Office of Human Research Protections (OHRP) and the UAMS Institutional Review Board will have access to research files. We will also provide information to the agency funding this study (the Substance Use and Mental Health Services Administration). However, this information will be linked to a

code number, and will include nothing that can be used to identify you. Results from this evaluation study will be reported to stakeholders, local and national groups and UAMS staff and clients in both formal and informal presentations.

To help protect your confidentiality we have been granted a Certificate of Confidentiality (CC) from the U.S. Department of Health and Human Services (DHHS) to protect the researchers from being forced, even by court order or subpoena, to identify you or provide any information collected in the study in any legal proceeding. (The CC does not imply approval or disapproval of the project by the Secretary of DHHS. It adds special protection for the research information about you.). However, the study participant or researcher may still choose to voluntarily disclose protected information under certain circumstances. You should know that we may provide information to appropriate individuals or agencies if harm to you, harm to others, or child use becomes a concern. In addition, the agency funding this research may see your information if it audits us.

Costs of Participating: The only foreseeable cost will be the costs associated with the time you spend completing the evaluation. In the event of any complication, injury, or illness requiring emergency medical treatment resulting from your participation in this study, appropriate acute medical care will be provided at no cost to you. However, the Principal Investigator and this institution have made no provision to reimburse you for the cost of medical care beyond emergency medical treatment or to pay for any lost wages, pain and suffering, hospitalization, or other expenses you may incur as the result of any such complication, injury, or illness.

Benefits of Participating: There may be some direct or indirect benefit to taking part in this study. The ongoing evaluation will be used to help improve the delivery of services to individuals like you. It is also possible that you will experience no direct benefit as a result of your participation.

Risks of Participating: The risks to you of being in this program are low. However, there are some possible risks to your participating in the program and evaluation. These possible risks are listed below.

- You may experience some discomfort due to the personal nature of some of the questions you will be asked to answer. Should that occur, you are free to end your participation in this study, and you are also free to decline to answer any specific question but continue to participate in this study. In either case, your eligibility to receive services will not be affected.
- Efforts will be made to keep all information you provide in the evaluation confidential; however, complete confidentiality cannot be guaranteed. Although unlikely, there is the possibility of harm to you if confidentiality is broken, such as embarrassment or the information being used against you.
- There is also the possibility of other, unforeseeable, risks to participating in this research study.

There are some rights that you should understand about participation in this study:

- a) Participation in this project is voluntary and does not involve additional costs to you. You are free to refuse to enter this study and you may withdraw yourself at any time simply by telling the research assistant or the investigator that you wish to withdraw. This will not jeopardize your participation in the program or medical care at UAMS. You are also free to refuse to answer any questions during any part of the evaluation, and still take part in the project. Your participation in this project may be terminated by the investigator if he/she sees fit to do so.

- b) You will receive a gift certificate valued at \$10 to compensate you for your time during two of the interviews (3 and 6months after intake). Participation in this study will result in no additional cost to you.
- c) The UAMS Institutional Review Board and the Office of Human Research Protections of may review study records.
- d) Significant new findings developed during the course of the research that may relate to your willingness to continue participation will be provided to you.
- e) You have not waived any legal right to which you are legally entitled by signing this form.
- f) If you have questions during the study about the research, you should contact the Principal Investigator at 501-XXX-XXX. You may call the Institutional Review Board representative at (501) XXX-XXXX regarding a research related-injury, with questions about your rights as a research participant, or to discuss any problems or concerns about the research. Also, you may call this number if you cannot reach the investigator or you wish to speak to someone not directly realted to this study.

I have read or had read to me the above statements and have been able to ask questions and express concerns, which have been satisfactorily responded to by the investigator. I understand the purpose of the study as well as the potential benefits and risks that are involved. I hereby give my informed and free consent to be a participant in this study. I have been given a copy of this consent form.

Participant's Name (Please Print)

Participant's Signature

Date / Time

Person Obtaining Consent

Date / Time

Witness

Date / Time

Principal Investigator

Date /Time

APPENDIX II: IRB DETERMINATION LETTER



UNIVERSITY OF
ARKANSAS

Office of Research Compliance
Institutional Review Board

July 22, 2016

MEMORANDUM

TO: Isis Martel
Wen-Juo Lo

FROM: Ro Windwalker
IRB Coordinator

RE: New Protocol Submission

IRB Protocol #: 16-07-007

Protocol Title: *A Study of Innovation in Concurrent Program Design: Addressing Mental Health Symptoms Among Co-Occurring Substance Abuse and Mentally Ill Clients who are Homeless in a Local Community Clinic Setting*

In reference to the request for IRB approval of your project titled *A Study of Innovation in Concurrent Program Design: Addressing Mental Health Symptoms Among Co-Occurring Substance Abuse and Mentally Ill Clients who are Homeless in a Local Community Clinic Setting*, the IRB is not authorized to oversee and approve such research. This protocol does not meet the definition of research involving human subjects in the federal regulations. (See the citation below.) You are free to conduct your research without IRB approval.

45 CFR 46.102 (f)

(f) Human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains

- (1) Data through intervention or interaction with the individual, or
- (2) Identifiable private information.

If you have any questions do not hesitate to contact this office.